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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,796	01/28/2002	Andrew Tofe	19583-00002	9310

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EXAMINER

DI NOLA BARON, LILIANA

ART UNIT PAPER NUMBER

1615

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/057,796

**Applicant(s)**

TOFE, ANDREW

**Examiner**

Liliana Di Nola-Baron

**Art Unit**

1615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### DETAILED ACTION

Receipt of Applicant's response, filed on December 22, 2003, is acknowledged.

#### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bhatnagar (U.S. Patent 5,635,482) in view of Gertzman et al. (U.S. Patent 6,030,635).

Bhatnagar discloses compositions comprising a matrix and synthetic peptides promoting cell attachment to the matrix and cell migration into the matrix, so that the compositions may be used for bone repair (See col. 3, lines 26-56). Bhatnagar teaches that compositions comprising hydrogels as the matrix promote the influx of cells (See col. 15, lines 4-5). With respect to the non-human bone-like material, hydrogel carrier and growth-inducing peptide claimed by Applicant, Bhatnagar teaches that for bone repair it is desirable to combine hydrogels with a bioceramic, such as hydroxyapatite, and inclusion of the peptides of the invention in the compositions comprising hydroxyapatite markedly increases the ability of cells to attach (See col. 15, lines 24-49). The hydroxyapatite disclosed by the prior art is non-human bone-like material. In Example 4 Bhatnagar teaches that particles of hydroxyapatite are coated with the peptide of the invention and the coated particles are incorporated into an agarose gel comprising

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the inventive peptide. In Example 5 said particles are used to promote the growth of fibroblast cells.

Thus, Bhatnagar provides compositions comprising a mixture of non-human bone-like material, hydrogel carrier and growth-inducing peptide. The patent is deficient in the sense, that the non-human bone-like material, specifically the hydroxyapatite used in the invention, is in the form of particles, rather than powder, as claimed by Applicant.

Gertzman et al. provides compositions comprising bone powder to heal bone defects and teaches that allograft bone of particle size of 100-420 microns is mixed with a hydrogel (See col. 4, line 50 to col. 5, line 35). Thus, Gertzman et al. provides the teachings that bone powder and bone particles are considered equivalent in the art of healing bone defects.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the combined teachings of Bhatnagar and Gertzman et al. to devise compositions comprising non-human bone-like powder, a hydrogel carrier and a growth-inducing peptide to promote new bone growth. The expected result would have been a successful composition for promoting new bone growth. Because of the teachings of Bhatnagar, that compositions comprising a synthetic growth-inducing peptide, hydrogel and bone-like particulate stimulate bone repair, and the teachings of Gertzman et al., that particulate and powder are considered equivalent in the art of bone repair, one of ordinary skill in the art would have a reasonable expectation that the composition claimed in the instant application would be

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successful in promoting new bone growth. Therefore the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gertzman et al. (U.S. Patent 6,030,635).

The patent provides bone powder compositions to heal bone defects and teaches that the compositions of the invention comprise demineralized, lyophilized, allograft bone, very high molecular weight hydrogels, such as sodium hyaluronate, and bone morphogenic proteins (BMP), which direct the differentiation of pluripotential mesenchymal cells into osteoprogenitor cells, which form osteoblasts (See col. 4, line 50 to col. 5, line 35). Additionally, the patent teaches that the compositions of the invention may include peptides and co-factors for protein synthesis (See col. 5, line 65 to col. 6, line 26).

Thus, the patent provides compositions comprising a mixture of bone powder, hydrogel and growth factors.

With respect to the non-human bone-like powder claimed by Applicant, the patent teaches that the allograft bone used in the compositions of the invention is hydroxyapatite matrix containing bone morphogenic proteins (See col. 1, lines 48-59), thus the patent discloses artificial bone-like powder, which is non-human, as claimed by Applicant.

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With respect to the hydrogel carrier claimed by Applicant, the patent teaches that the ideal carriers for the compositions of the invention are high molecular weight hydrogels (See col. 5, lines 6-14).

With regard to the growth-inducing peptide claimed by Applicant, the patent is deficient in the sense, that it discloses bone morphogenic proteins as growth-inducing factors, and not a peptide, as claimed by Applicant. Proteins distinguish over peptides, in their ability to fold into a three-dimensional conformation, whereas peptides comprise the primary structure of amino acids and do not have necessarily a secondary or tertiary structure generated by the folding of the primary sequence. One of ordinary skill in the art would have been motivated to choose an appropriate portion or segment of the bone morphogenic proteins disclosed by the patent, and generate a peptide that imparts the bone morphogenic function and induces growth, with the expectation to provide a composition having an enhanced growth effect compared to the activity of the compositions comprising the whole protein disclosed by the prior art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the compositions disclosed by Gertzman et al. by substituting the bone morphogenic proteins disclosed by the prior art with a growth-inducing peptide to promote more effectively and enhance new bone growth. The expected result would have been a successful composition for promoting new bone growth. Because of the teachings of the patent, that compositions comprising demineralized bone powder, a hydrogel carrier and bone morphogenic proteins induce accelerated healing at the bone site, one of ordinary skill in the art

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would have a reasonable expectation that the composition comprising a growth-inducing peptide claimed in the instant application would be successful in promoting new bone growth. Therefore the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

### ***Response to Arguments***

4. Applicant's arguments filed on December 22, 2003 have been fully considered but they are not persuasive.

5. Applicant argues that Gertzman et al. only discloses human allograft bone powder or granules, not non-human bone-like powder. In response to said argument, it is noted that Gertzman et al. defines allograft bone as "hydroxyapatite matrix reinforced with collagen fiber and containing active bone morphogenic proteins" (See col. 1, lines 50-53). The hydroxyapatite material disclosed by the prior art is non-human bone-like powder, as claimed by Applicant.

### ***Conclusion***

6. Claim 1 stands rejected.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liliana Di Nola-Baron whose telephone number is 571-272-0592. The examiner can normally be reached on Monday through Thursday, 8:30AM-7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 17, 2004

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